

however rude; and Mr. Layard's discovery of a crystal magnifying lens at Nineveh indicates that such an instrument may have actually been in use.\*

The portion of Chaldean astronomy which was concerned with the planets was unnecessarily complicated by the habit of naming them from the fixed stars near which they happened to be at different times of the year, so that the same planet is often spoken of under varying names. Thus *Nibatanu* was properly Altair, but became a very common title of Mars. The number of the fixed stars observed by the Chaldeans was very great, and again suggests the use of something more than the naked eye. The principal stars had individual names, the rest being included in the constellations to which they belonged. In this way the heavens were mapped out long before the idea of a terrestrial atlas had suggested itself. The identification of the Chaldean constellations and fixed stars is of course a work of considerable difficulty, but the modern representatives of several of them have now been determined, and with the help of these and fresh astronomical texts, there is every reason to hope that our knowledge of the celestial globe of the Babylonians will be as complete as it is in the case of the Greeks and Romans.

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#### COMTE'S PHILOSOPHY

*The Positive Philosophy of Auguste Comte*, freely translated and condensed. By Harriet Martineau. In Two Volumes, 8vo. Second Edition. (London: Triibner and Co., 1875.)

THE first edition of Miss Martineau's version of the "Positive Philosophy" was published in the autumn of 1853. The considerable space of time which has since elapsed cannot have been due to any defect in the adapter's work. So excellently were the translation and condensation accomplished by Miss Martineau, that Comte substituted her two volumes for his own six volumes, and since Comte's death the work has actually been retranslated into French. It does not give us a great idea of the demand for Comte's works in England, when we find that twenty-two years intervene between the first and second editions. At last, however, the work is re-issued in two handsome volumes, but we are not informed that any alteration at all has been made either in the matter or language of the work, and I have not been able to detect a difference even in a word. The appearance of this new edition nevertheless affords an opportunity for a few remarks upon the value and pretensions of the "Positive Philosophy."

It has been asked "What's in a name?" As regards the positive philosophy, it may be answered that there is a great deal in the name. The name Positive is an admirable *question-begging epithet*. Everything which Comte wished to stamp with his approval, and make a part of his system, he called positive, and a formidable list of new names was invented. We have Positive

Philosophy, Positivism, Positivity, Positive Method, Positive Polity, Positive Morality, and even Positive Practices. It would be much more correct to say Comte's Philosophy, Comtism, Comte's Method, Comte's Polity, Comte's Practices, because I believe it is impossible to attribute any invariable meaning to the word Positive, as used by Comte, except that it meant what belonged to his system. Nevertheless, the word was of inestimable value to Comte, because it enabled him to represent all his own views, some being of the most peculiar character, as the natural outcome of the Baconian Philosophy.

We frequently find Comte stating, in the frankest manner, that there was nothing new in the idea of a positive philosophy. Bacon and Descartes (vol. ii., pp. 381, 386, &c.) were the two great legislators of the philosophy. Even the common sense of ordinary thinkers contains all the elements of Positivism, provided that absurd metaphysical and theological ideas do not obscure them. Through Hume, Brown, and a few other philosophers, the pure method of positivism descended to Comte, whose mission it was to develop a complete system of positive thinking. When we attempt to find a clear definition of what the positive method is, it appears to be simply synonymous with the scientific method of induction, resting upon facts. Having thus invested himself with the prestige of whatever is best in the results of modern science, Comte proceeds to deliver at full length his own ideas of the origin and progress of civilisation, the grounds of morality, the best form of government, and the coming system of religious worship. All these ideas, being called positive, are of course the necessary outcome of the pure scientific method.

The following is one of the clearest statements, which I can find, of the nature of the positive method (vol. ii. p. 424):—"The Positive Philosophy is distinguished from the ancient . . . by nothing so much as its rejection of all inquiring into causes, first and final; and its confining research to the invariable relations which constitute natural laws. . . . We have accordingly sanctioned, in the one relation, the now popular maxim of Bacon, that observed facts are the only basis of sound speculation; so that we agree to what I wrote a quarter of a century ago,—that no proposition that is not finally reducible to the enunciation of a fact, particular or general, can offer any real and intelligible meaning. On the other hand, we have repudiated the practice of reducing science to an accumulation of desultory facts, asserting that science, as distinguished from learning, is essentially composed, not of facts, but of laws, so that no separate fact can be incorporated with science till it has been connected with some other, at least by the aid of some justifiable hypothesis." Now this passage not only contains very good sense, but it may be regarded as a most clear statement of what correct scientific method aims at, the ascertainment of general laws. But there is nothing whatever in this to distinguish the positive method from that pursued by all scientific inquirers who have any share of the spirit of Galileo, or Gilbert, or Newton, or Hooke, or Lavoisier, or Laplace, or Faraday. The question really is, then, whether Comte, having properly formulated the method of scientific inquiry, knew how to apply it in regions where he was not led by greater minds. There is no

\* A broken tablet I have come across seems to record a transit of Venus across the sun. It is to be hoped that Mr. Smith will before long succeed in bringing to England the remainder of the Kouyunjik Library. At present a tablet is often broken off at its most interesting part, while the corresponding fragment is still lying under the soil on the banks of the Tigris.

doubt that Comte possessed a remarkably extensive and generally accurate knowledge of mathematics, astronomy, and many portions of physics and chemistry, as developed in his day. The first part of his work is therefore comparatively free from objection, and consists to a great extent of an interesting and able review of the progress of physical science.

Incidentally I may remark, that Comte, while continually sheltering himself under Lord Bacon's great name, appears to have known little or nothing of Bacon's works. If there was one thing which Comte abjured, it was the inquiry into causes, whereas Bacon quotes approvingly the old dictum that "truly to know is, to know by causes." Every reader of the "Novum Organum" must be aware that Bacon deals not only with causes, but with still vaguer ideas, Forms, Natures, Essences, terms so metaphysical that even the editors of Bacon hardly pretend to make out clearly what they mean. The following is a characteristic extract from the second book of the "Novum Organum" (Aphorism iv.):—"The true form is such that it deduces the given nature from some source of essence which is inherent in things, and is better known to nature, as they say, than Form is. And so this is our judgment and precept respecting a true and perfect axiom for knowledge, that another nature be discovered which shall be convertible with the given nature, and yet be a limitation of a more general nature, like a true genus." It is possible that Bacon knew what he meant, but his own employment of his "true and perfect axiom" was no more happy than I hold Comte's application of his positive method to be.

It is of course impossible to show in a single brief article how crude and unscientific were Comte's results when he applied his method to new fields of research, especially in Sociology. One of his supposed greatest discoveries was the philosophical law of the succession of three states: the primitive theological state, the transient metaphysical, and the final positive state. This is one of those vague and hasty generalisations which have the worst scientific vice of being incapable of precise verification. The theory can be stretched, like india-rubber, to cover any difficulties. If we object that the Hebrews were from the earliest historical times Monotheists, and have so continued to the present day, we are told that they were *prematurely monotheistic*, and are left to imagine that they will ultimately become positivists. What sufficiently condemns Comte's laws of evolution is that they led him away from the doctrines of evolution as now established by Darwin and Spencer, and their followers. Comte was well acquainted with Lamarck's views, which he discusses in Book V. chap. 3, coming to the unfortunate conclusion (vol. i. p. 345) that in every view Lamarck's conception is to be condemned, and "that species remain essentially fixed through all exterior variations compatible with their existence." In the beginning of the fifth chapter of the sixth book, too, we find a passage which entirely cuts Comte off from any share in the sociological doctrines of Spencer. "Gall's cerebral theory," he says (vol. ii. p. 105), "has destroyed for ever the metaphysical fancies of the last century about the origin of man's social tendencies, which are now proved to be inherent in his nature, and not the result of utilitarian

considerations." It is highly remarkable that, though the germs of the new philosophy of evolution had been put afloat by the elder Darwin, Lamarck, Malthus, and others, both Comte and his admirer, John Stuart Mill, entirely failed to appreciate their value.

There is no doubt that Comte had very wide and general views as to the possibility of creating great bodies of social science, described by various combinations of the adjective Positive, such as Positive Morality, Positive Polity; but I quite deny that he had any true conception of the proper way of going about the work. It is impossible that he should have, because he altogether abjured and ridiculed that branch of mathematical science, namely, the theory of Probability, by which alone we can approach the scientific investigation of the complex condition of a nation. He says (vol. ii. p. 416): "Mathematicians drop the supposition of natural laws as soon as they encounter phenomena of any considerable degree of complexity, and especially when human action is in any way concerned; as we see by their pretended calculation of chances, through a special application of analysis—an extravagance which is wholly incompatible with true positivity, but from which the vulgar of our algebraists still expect, after a century of wasted labour, the perfecting of some of the most difficult of human studies." It becomes hardly possible to treat Comte's pretensions seriously, when we contemplate this intellectual freak by which he rejects the theory which is becoming more and more the basis of all exact science. The more exact and perfect, in fact, a science becomes, the more complete is the application of the rules derived from the theory of probability. In the computations at Greenwich and other astronomical observatories, they are used in almost every reduction. Nothing is more accurate than a good trigonometrical survey, and yet there is no work to which the theory of chance is more elaborately applied. In proportion as chemistry and physics become exact and methodical sciences, they also resort to the theory of chance, as we see in the researches of Sir B. C. Brodie, or the elaborate labours of Prof. W. H. Miller on standard weights and measures.

As to social science, the Method of Means and the law of divergence from an average, founded on the theory of probability, are simply the alpha and omega of scientific method. We cannot stir a step in any branch of statistical inquiry without drawing an average, and we cannot do this unless we accept the theory which Comte ridiculed. Quetelet is the true founder of exact social science, and his long labours consisted in the unwearied application of the doctrine of chance to vast bodies of statistical facts. In Mr. Francis Galton's works we find the same true method carried out with perfect appreciation of its value.

I might go on to point out, again, that the one branch of social science which most early assumed a partially scientific form, namely, political economy, was that to which Comte entirely refused his *imprimatur*. He never would allow it to be called Positive, though he predicted that in the positive era the world would be governed by bankers. Criticism, however, is disarmed when we consider the vagaries to which the positive method is supposed to have led its great expositor.

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